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THE PATENT OFFICE

22 MAR 2002

The Patent Office

22MAR02 E705862-1 C45241
P01/7700 0.00-0206798.1

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

EMERGENCY PATHWAY LIGHTING SYSTEM

2. Patent application number

(The Patent Office will fill in this part)

0206798.1

22 MAR 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

DAVID RICHARD VERDON DIER

ICAWARDINE CLOSE

Patents ADP number (if you know it)

WOODHAM VILLAGE

CO. DURHAM. DL5 4XE

If the applicant is a corporate body, give the country/state of its incorporation

7822380002

4. Title of the invention

EMERGENCY PATHWAY LIGHTING SYSTEM

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Nigel Brooks
Hill Hampton
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Hampshire GU32 1QN

(as per
S17, 22/4/03)

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

UK

0202077.4

30. 1. 2002

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

8

Claim(s)

Abstract

Drawing(s)

8 + 8 = 16

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I request the grant of a patent on the basis of this application.

Signature

Date 20/3/2002

12. Name and daytime telephone number of person to contact in the United Kingdom

David R. Edmunds . 01388 720103

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Notes

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EMERGENCY PATHWAY LIGHTING

The invention relates to emergency pathway lighting.

Emergency pathway lighting is often positioned at low / floor level in buildings, ships, aircraft or other structures. In the event of fire smoke is usually present and can obscure the exit points and routes making escape very hazardous. Pathway lighting is positioned at low levels for two main reasons.

1. The oxygen at floor level is usually greater than at a higher elevation in for example a corridor.
2. The escapee can get down on their hands / knees and follow the pathway lighting system to an exit / escape point.

Existing linear: one section of pathway lighting supplies power to a given number of sections are juxtaposed to each other to create an illuminated pathway. A section of pathway lighting may consist of one or more printed circuit boards onto which the light sources are positioned. The printed circuit boards may abut each other and have an electrical means of interconnection. The flow of electricity from the input / start through a given number of printed circuit boards via the interconnections enables the lights thereon to be illuminated. The linear printed circuit boards are then inserted into a suitable housing (tubing circular, square, and rectangular). The housings with the printed circuit boards inside are then sealed. They either have wires coming out of one / both ends or have a means of accepting electricity via a plug / connector assembly. Existing pathway modules are usually daisy chained together. The pathway systems are powered externally. These power supplies also have a battery back up unit which is activated when there is a mains failure. **Figure 1** shows an example of an installation of emergency pathway lighting in accordance with the prior art. There are several potential failure points in existing pathway systems.

1. Should the central power supply containing the emergency battery back up suffer ingress of water (from sprinklers, hoses, sea water or other) This would cause the battery back up to short circuit: the result a complete failure of pathway system being supplied from that particular battery back up.
2. Should the electrical supply line from the battery back up to the pathway system become breached: the result a complete failure of pathway system being supplied from that particular battery back up.
3. Should any of the linking units that join one pathway module electrically to another become breached: the result failure of pathway units from the point of breach.
4. Should any given pathway lighting module suffer electrical damage the juxtaposed modules and even local system could fail.

The invention seeks to create an emergency illuminated pathway system where these failures are eliminated.

Figure 2 shows the invention as a system. The invention seeks to create a pathway system which does not require a central battery back up as stated in the prior art. The invention seeks to create a pathway system where ingress of water to the battery back up and or lighting circuitry is eliminated. The invention seeks to create a pathway system wherein the lighting modules (housed in tubes, and or castings) are self contained, sealed stand alone units without the need for wire connections thereto and therefrom. The invention seeks to create a pathway system where the need to daisy chain the modules as stated in the prior art is eliminated. It would be possible to remove a section of the invention from the pathway and it would continue to function. The lighting modules of the invention would continue to function under water whether in the pathway line or not.

The invention consists of two essential elements.

1. The sealed self contained battery backed up pathway lighting module (17).
2. The carrier (18) which houses the pathway lighting modules (17).

The invention incorporates the electro magnetic principal of induction. The carrier (18) may house one or more voltage conditioning circuits (2) which work in conjunction with one or more primary coils (3) which are positioned at determined intervals along the carrier (18).

The sealed lighting modules (17) house one or more secondary coils (4). The lighting module (17) secondary coil (4) is placed strategically about the primary coil (3) as found in the carrier. When the primary coil (3) and secondary coil (4) are positioned about each other at a pre determined location and distance apart from each other electricity can flow from the primary to the secondary coil without the need for wires and or other electro mechanical joining means.

The material of the pathway lighting module and the housing of the primary coil assembly / carrier section must be compatible for the electro magnetic induction process. The ability to pass electricity through the wall of the lighting module and to the subsequent circuitry therein and battery back up therein enables the invention to be a completely sealed stand alone emergency pathway module.

The sealed illuminated pathway module:

In one embodiment of the invention one or more printed circuit boards are fitted with one or more preferred light sources (10, 14). The light sources are placed at pre determined positions and or intervals along / about the printed circuit boards. The light sources are wired either in series parallel and may be in conjunction with other electrical devices (9, 10, and 11) or in parallel (14) and or preferred combinations of both. There may also be the incorporation of other devices such as sounders (15) to further assist an escapee. There may be one or more circuits (13) incorporated in the design of the lighting modules.

Figure 3: The minimum requirement of a pathway module:

A secondary coil (4) outputting voltage (5) into a rectification circuit (6) this in turn goes to a battery charger/ changeover circuit (7) and also one or more lighting and or sounder or other circuits. The battery charger/changeover circuit (7) is linked directly to the batteries and or holders (8). There may be provision in the battery charger circuitry for an indicator to show that the charge function is being performed. These are positioned along or about a printed circuit board in preferred layouts. Combinations of the above minimum requirements and multiples there of can make different embodiments of the pathway modules.

Figure 4 In another embodiment of the invention the light sources may be utilised to form shapes such as directional arrows and or pictograms showing exit points and or other information such as fire extinguishers, hoses. These modules would also be sealed in accordance with the invention and contain the secondary coil (4) and battery back up capability.

The carriers are preferred housings which position the illuminated pathway system about the primary coil (3) assemblies there in and or there on. The design of the carrier varies depending upon its application. The carrier may also facilitate the usage of the markers such as directional arrows as aforementioned.

Figure 5 shows sectional details of various carriers and descriptions as to their applications. The carriers are manufactured from preferred materials so as to give consideration to the electro magnetic induction process as utilised by the primary coil assemblies and their positioning there in and or there on.

When the system is mains healthy the voltage is supplied to the voltage conditioning circuitry (2) and in turn to the primary coil assemblies (3) which are positioned along the carrier. The primary coils (3) work with the secondary coils (4) inside the pathway modules.

The secondary coils (3) output is rectified and battery charger / changeover circuitry is powered along with illumination devices (10, 14). When the mains fail the changeover circuitry (7) switches the power requirements of the light sources (10, 14) and or other devices (15) inside the pathway module over to the internal back up batteries (8). These in turn will run the pathway module for pre-determined duration. The batteries (8) may be positioned in a chamber or about the printed circuitry as afore mentioned. The chamber and or area about the battery location would have a removable top and or side so as to gain access to the batteries / holders for replacement. The access trap (s) would be of a design whereby when affixed back to the pathway lighting module a watertight / gas tight seal would be realised.

Key to figure 3

1. Voltage in
2. Voltage conditioning unit
3. Primary coil
4. Secondary coil
5. Voltage out
6. Rectification circuit
7. Battery charge / switching circuit
8. Battery holders / batteries
9. Resistor
10. Light emitting diode (LED)
11. Rectifier (diode)
12. Plugs, sockets, jumpers, connectors
13. One or more voltage supply circuits in the lighting modules
14. Other light sources
15. Other devices, sounders, beacons
16. Printed circuit boards
17. Sealed lighting modules (cast, extruded, moulded or combinations thereof – pathway arrow modules, light sources, lumieres, downlighters, floods, bulkhead fittings, tubular light fittings, flexible linear light pathway modules).
18. Carriers – extruded and or cast

Key to figure 5

18a Carpet to smooth floor carrier

18b Carpet to carpet

18c Carpet to wall

18d Channel

18e Corner

18f Ramp

18g Hand rail

18h Stair capping / nosing

Key to figure 6

17a Right angle pathway module (this module may also be curved)

17b Cross – pathway module

17c T section pathway module

Key to figure 7

Bulkhead type fitting. Sealed unit complete with batteries (8) light sources (10,14) reflectors(22) front lenses (21) battery charge indicator (7) secondary coil assembly (4). In this embodiment the light sources are arranged around and about a reflector of a preferred design (22). Said reflectors can amplify the light output from the unit and or direct the

Light output to meet required criteria.

Key to figure 8

In this embodiment the sealed unit resembles a light bulb in shape. The light sources are set about a sub striate and or printed circuit board (16) in a preferred layout. The body of the unit houses the batteries and charging circuitry thereto. The secondary coil (4) slots into a receptacle that houses the primary coil. The front of the sealed unit has a lensed face (21). Said lenses may vary in design so as to alter the light output from the unit (flood, narrow beam, projected, diffused, spot)

Key to figure 9

In this embodiment the sealed unit takes the form of a baton. Said baton is linear and may vary in length. The baton is likeable to a fluorescent tube shape. The baton contains the secondary coil (4) and all the battery and changeover circuitry in accordance with the invention.

Key to figure 10

In this embodiment the light sources (10, 14) are housed in one or more chambers. Said light sources may be positioned around and about one or more reflectors. The chamber and or housing can accept and accommodate one or more fibre optic bundle end collectors (23). The fibre optic strands (19) transmit the light from the chamber to the lenses and or other devices attached thereto (20). These devices may then be set about a reflector (22). The unit is sealed and contains all the circuitry in accordance with the invention. The design and configuration of the reflectors and front lenses of the unit may vary depending upon the light output requirements as afore mentioned.

KEY TO FIGURE 11,12,13,14.

Figure 11 face view

Figure 12 side view

Figure 13 base view

Figure 14 perspective view of sealed enclosure showing lensed faces.

In this embodiment the light sources (10, 14) are positioned in more than one plane. The sealed unit contains all the circuitry in accordance with the invention the light output is from more than one surface of the enclosure (fig12). The enclosure may be moulded in a thermoplastic material, fitted with the preferred circuitry and then in turn sealed so as to be totally water proof, dust proof and gas proof. The sealed Lumiere is charged via the secondary coil (4).

The object is to create a completely sealed emergency light fitting that does not require any wire to the enclosure. This is achievable by utilising the induction process as afore mentioned. The ~~light fitting~~ be housed in a preferred design so as to be positioned about ~~the light fitting~~ in a preferred manner.

FIGURE 1

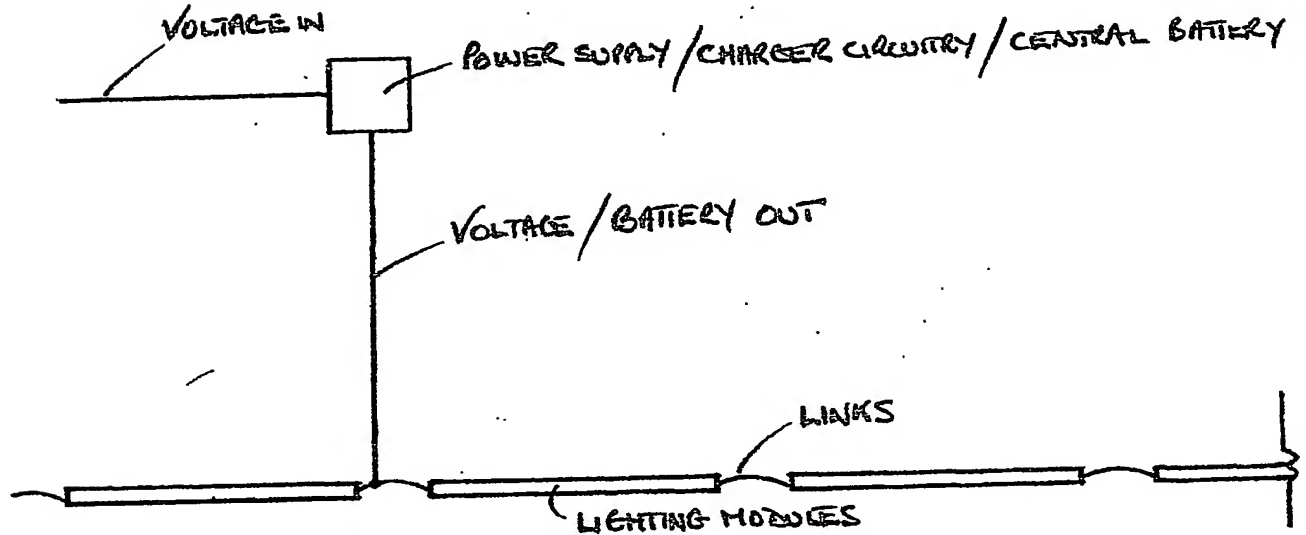
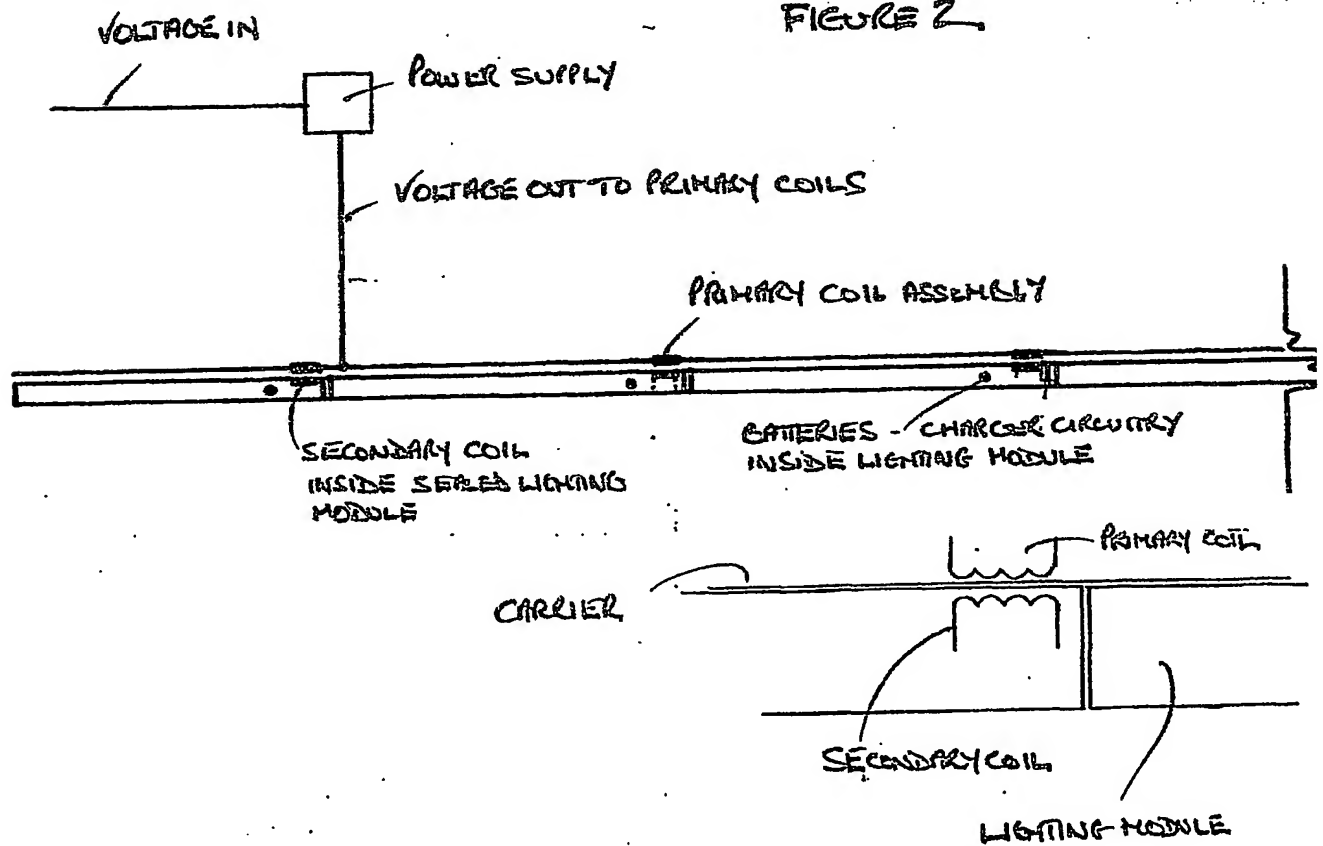


FIGURE 2



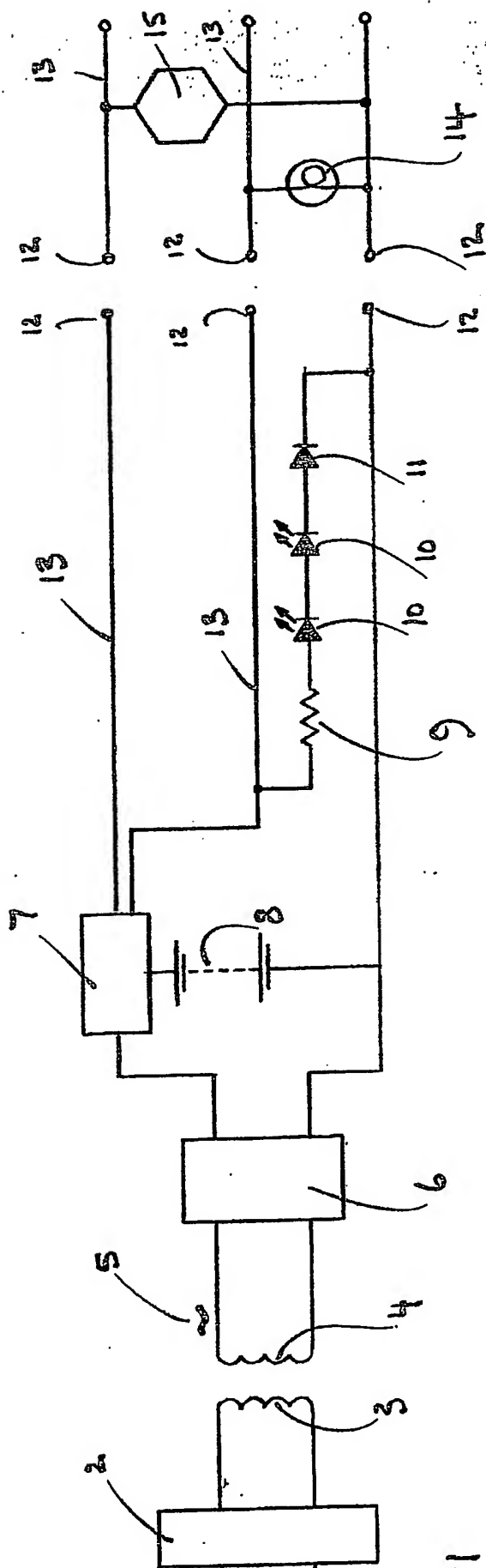
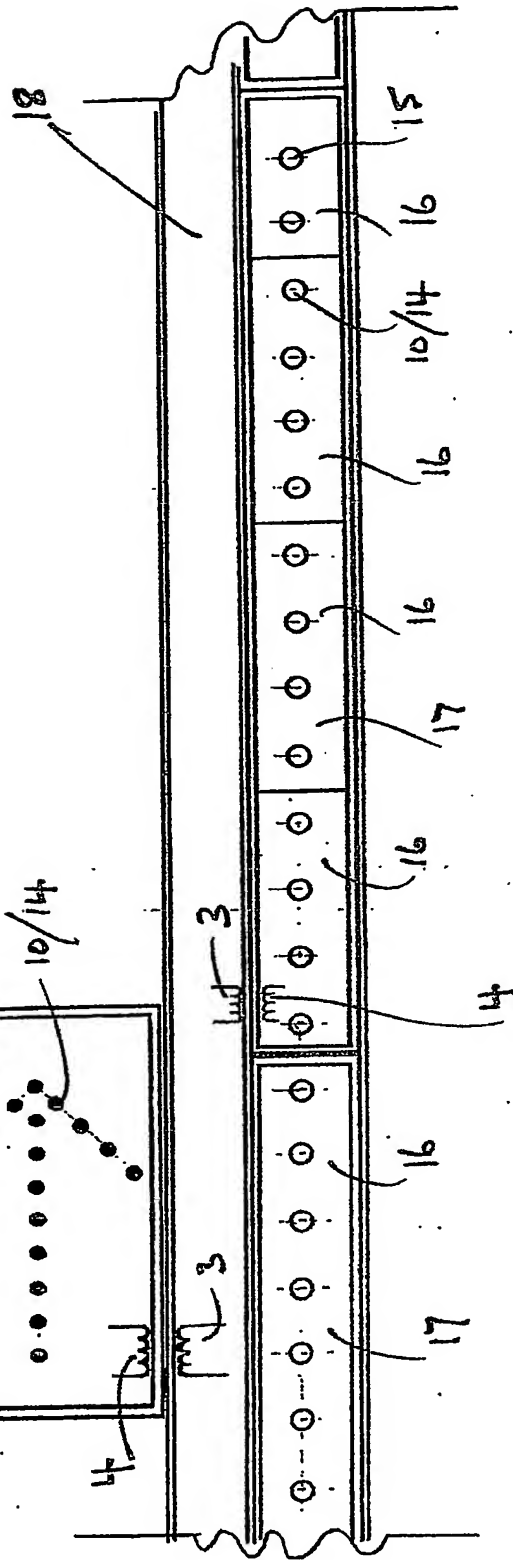
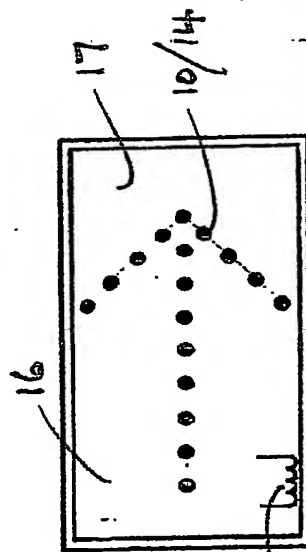
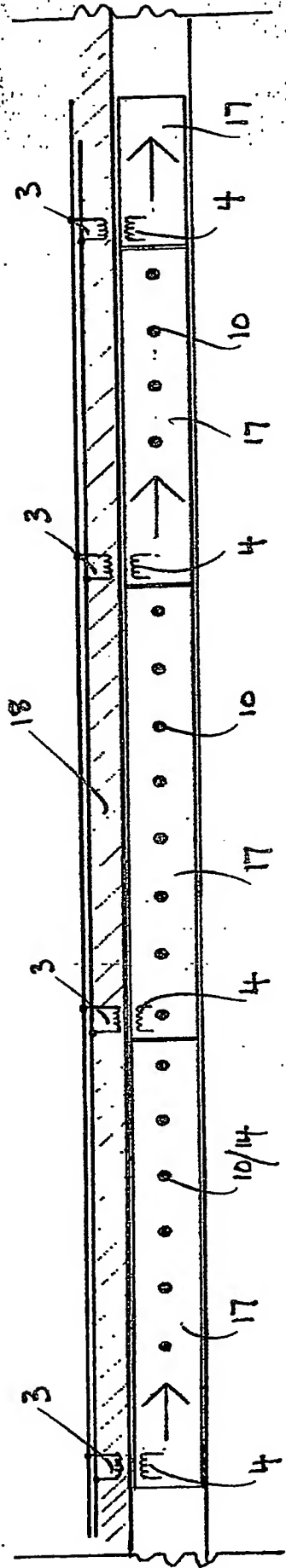


FIGURE 3

3/8

FIGURE 4



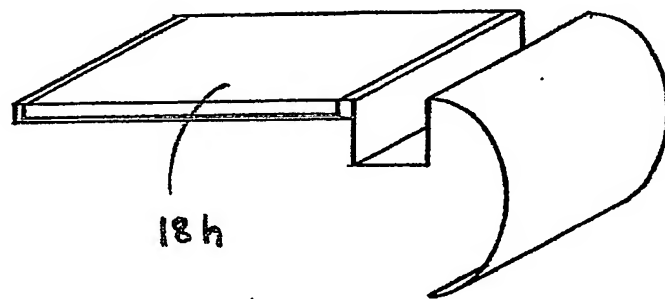
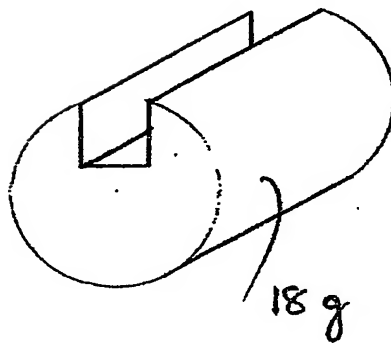
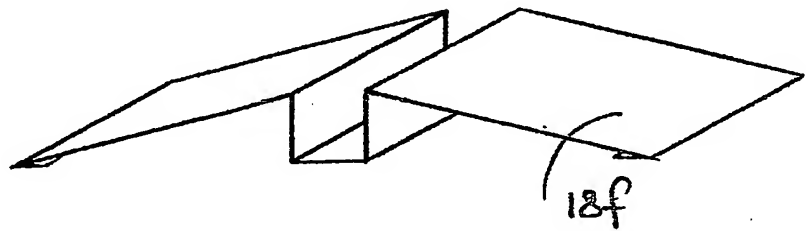
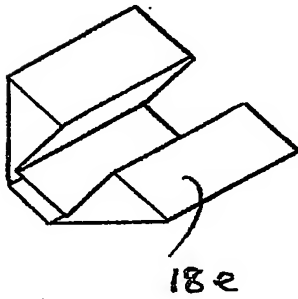
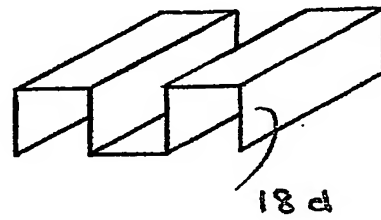
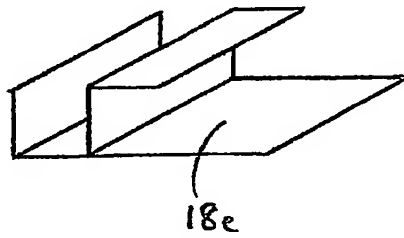
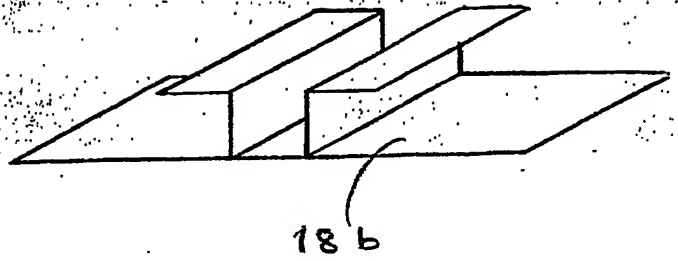
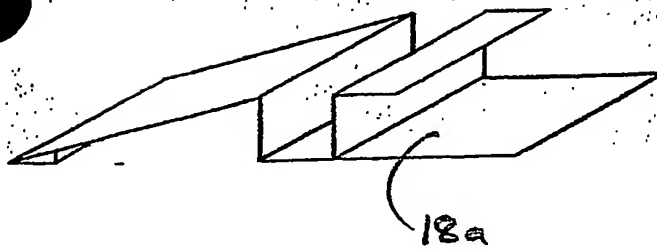
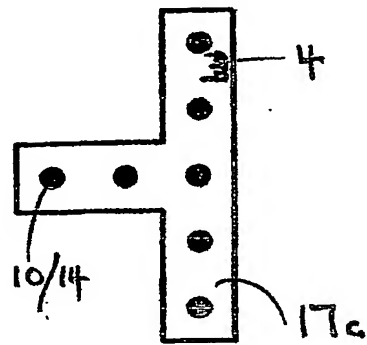
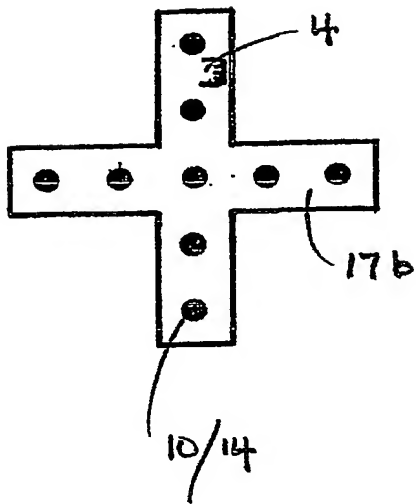
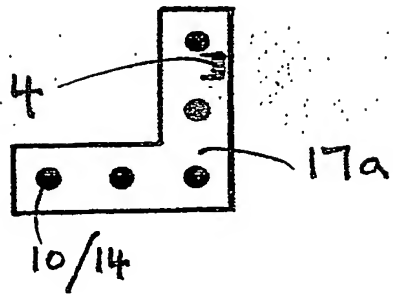
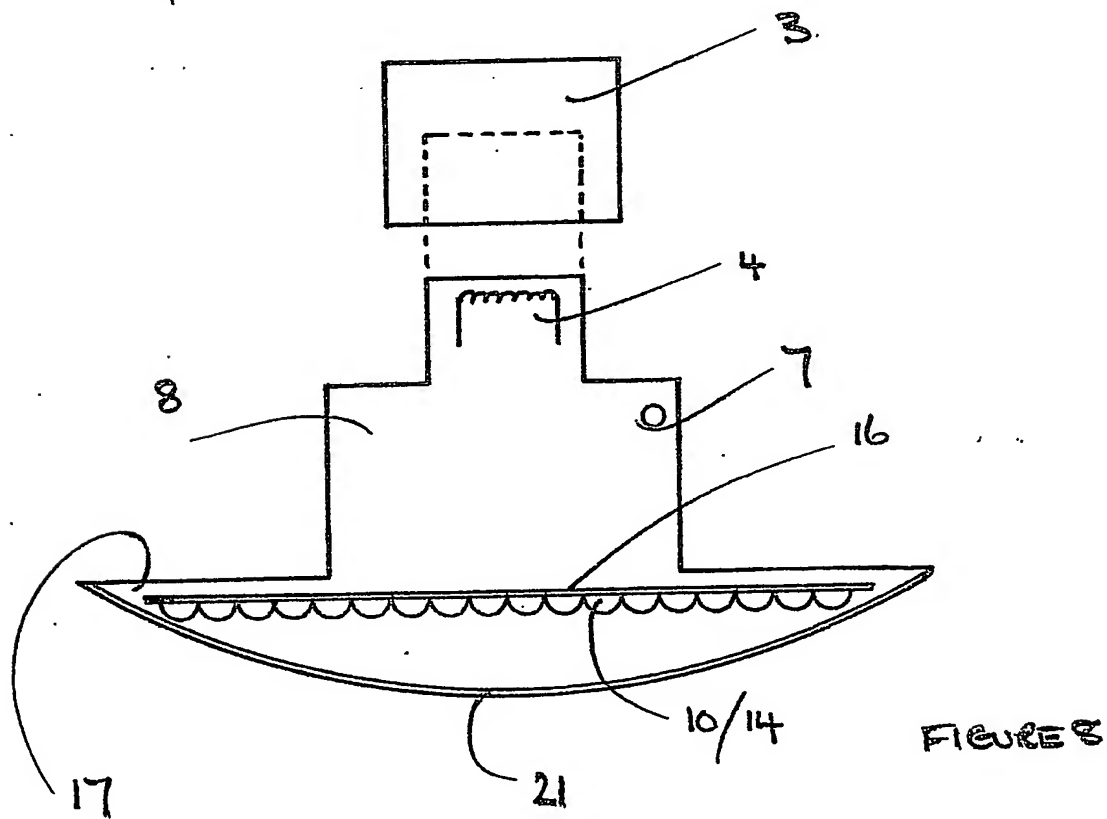
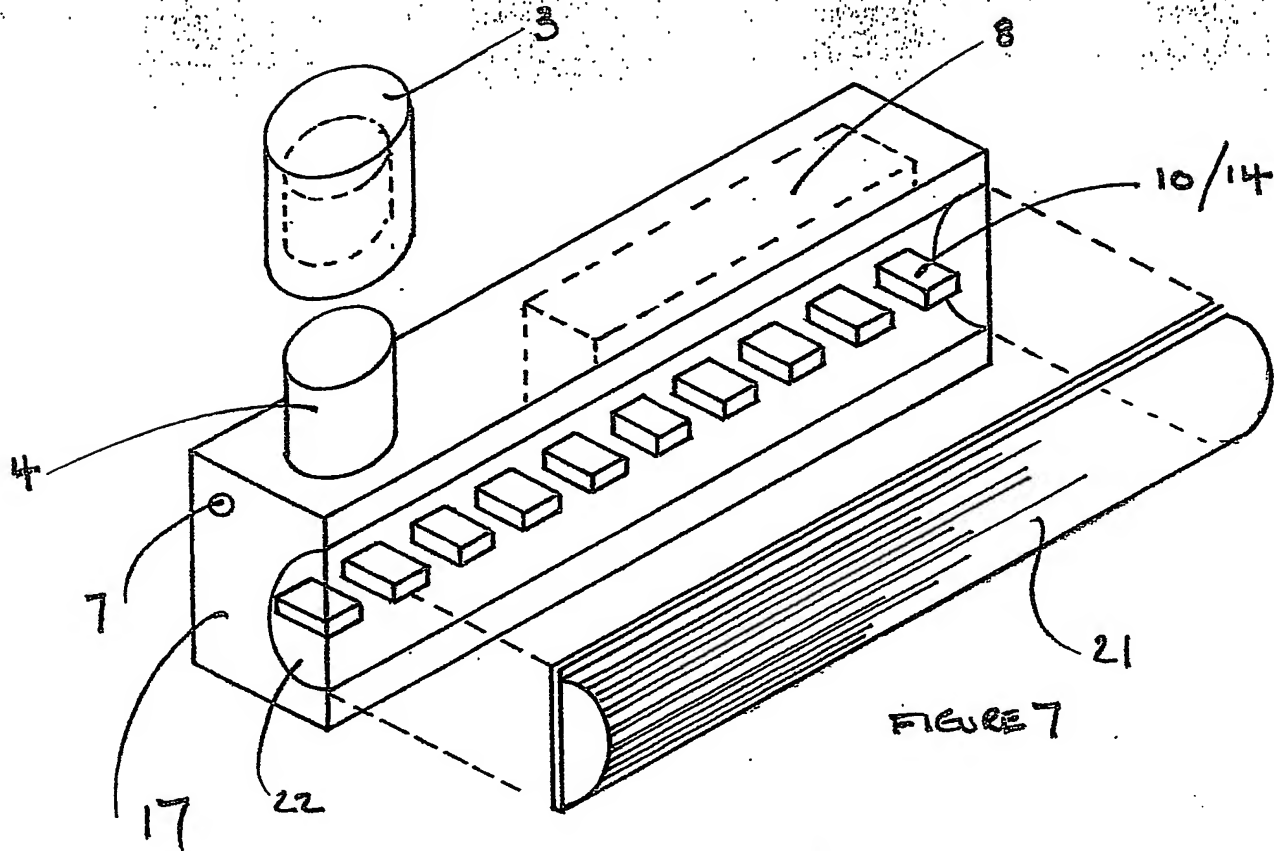


FIGURE 5

5/8



6/8



7/8

